understates the investment necessary to serve rural customers. Also, from the above data, it is interesting to note the number of NIDs placed in each cluster. Cluster 56 only has 2 households, but 3 NIDs are placed, while clusters 42 and 53 do have the correct number of NIDs. The SM is not consistent in its placing of NID investment. It is unclear whether these problems are caused directly by the use of fractional lines.

Another problem caused by the fractional line count is that the distribution cable size calculation systematically understates the correct size of the distribution cables within the SM. For example, in cluster 42, the distribution cables are undersized. In cluster 42, the lines per customer point is less than one (.382), therefore, it takes at least three customer points to exceed a 1 pair cable. That means that the majority of the customer points in this cluster are served with three small one pair cables. It may be that all customer points within a quadrant are served by a single pair cable if the lines are rounded before accumulating. This does not even address the question as to whether the one pair cables that the SM utilizes exist anywhere but in the SM's theoretical network.

The above examples represent some of the impacts of fractional lines in rural areas in the western United States. To the extent that other clusters have customer locations with partial lines, their cable costs will be understated as well.

Calculated Densities

In addition to the foregoing, there is a problem with the way SM calculates densities. As can be seen with the Douglas, Wyoming data above, the densities for the clusters that have only a single customer are incorrect. For example, cluster 53 has only a single customer and yet its density is listed as 215 lines per square mile. The area for this cluster is shown to be .0046, which represents a square with a 360 foot side. This seems reasonable. However the density calculation appears to be mysterious. It is not clear how a single household or business can generate a density of 200 or how close the nearest customer point is in the adjacent cluster, which is the most relevant consideration for calculating density. Having the density miscalculated in this way again results in understating costs for the rural customers.

E. Housing Units versus Households

The FCC's tentative conclusion that only households currently served with telephone service should be used to estimate the cost of serving current demand is seriously flawed. The Commission is confusing providing network connections to existing habitable vacant housing units in metropolitan as well as rural areas with provisioning plant to accommodate future growth. These are two very different conditions. In areas in which telephone companies provide service, the standard practice is to provide network connections to all existing habitable units. This is a least-cost practice. Both urban as well as rural areas in the 14-state U S WEST territory experience considerable churn. Churn occurs when current customers disconnect service at one location and start service in a second location within the same state. Telephone service providers cannot predict which homes in an inventory of housing stock will be inhabited at any particular time, nor can they move their outside plant facilities from one neighborhood to another. Thus, this practice allows telephone companies to meet current demands for service with acceptable installation intervals.

The SM network should provide network connections to **all housing units**, including housing units that are currently unoccupied. This is consistent with the obligations to serve imposed upon U S WEST's and other ILECs. When a household moves into a previously unoccupied housing unit, U S WEST is usually required to have facilities ready to serve the destination housing unit. The SM network can not fulfill the ready to serve obligation if it does not design plant to all housing units. There are also significant cost savings associated with installing all loops to a geographic area concurrently. It would prove prohibitively expensive to extend the network to housing units on a one at a time basis as they become occupied.

F. General Support Facilities

Support assets are critical to providing all telecommunications services. Support assets include:

1. The land and buildings in which employees and the general support assets are housed;
2. The trucks, cars and other work equipment used to transport employees between job locations and maintain the network; and
3. The computer and other operating systems needed to among other things track network operations and performance, account for the companies financial performance, track and bill the companies' products, services and customers.

These support assets are an integral element in providing all the companies products and services. The SM identifies these assets as GSF investments. As stated in the SM documentation "GSF costs and expenses include the investment and expenses related to vehicles, land, buildings, and general purpose computers." These support assets are an integral element in providing all the companies products and services. Without trucks and cars, technicians could not make repairs to the outside plant network. Without systems to track the existing outside plant and other network facilities, network problems could not be identified and addressed. Without the financial budgeting and tracking systems, funds could not be obtained and directed to the resources necessary to maintain and grow the network. These assets are an integral and essential ingredient in the building and maintenance of a functional telecommunications network.

The SM uses a multiple step process to develop the costs for the cost of support assets that are to be recognized in the model. The process begins by identifying the book cost or historical costs of these investments as identified on the companies' financial reports. Several adjustments are then made to:

1. An adjustment to eliminate certain types of plant from consideration in the model;
2. Restate the investments to reflect the current or future costs for deploying these same assets; and
3. Determine what portion of the cost of these assets is related to the provisioning of supported services.

The end result of this multi-step process is a significant reduction in the costs that are assumed to be recoverable through the fund. By applying repeated ratios to individual amounts the result is a fraction of the original costs. No justification for the number or magnitude of these ratios is given in the order.

Following is a chart showing the development of the support asset amounts that the FCC assumes are attributable to supported services:

USWC General Support Facilities
Calculation of Allowable Modeled Amounts

Total TPIS (including Gen Supp)	$5,562,422,000
Total TPIS (before amortizable assets)	$4,112,770,000
Modeled TPIS	$2,547,314,640
Plant Ratio	61.9%

	Booked Investment	Elimination Ratio	Investment Considered	Future Cost Ratio	Sub Total	Supported Services Ratio	Adjusted Investment
Land	$15,083,000						
Motor Vehicles	$53,595,000		$53,595,000	61.94%	$33,194,982	42.604%	$14,142,390
Aircraft	$1,875,000						
Special Purpose Vehicles	$85,000						
Garage Work Equipment	$2,222,000		$2,222,000	61.94%	$1,376,234	42.604%	$586,331
Other Work Equipment	$35,127,000		$35,127,000	61.94%	$21,756,510	42.604%	$9,269,143
Buildings	$485,746,000	50%	**$242,873,000**	61.94%	$150,427,558	42.604%	$64,088,157
Furniture	$9,921,000		$9,921,000	61.94%	$6,144,742	42.604%	$2,617,906
Office Equipment	$33,757,000		$33,757,000	61.94%	$20,907,977	42.604%	$8,907,634
General Purpose Computers	$700,187,000		$700,187,000	61.94%	$433,672,828	42.604%	$184,761,972
Total Land & Support Assets	$1,337,598,000		$1,077,682,000		$667,480,831		$284,373,533

Combined, the above the above ratios reduce the actual GSF investment by approximately 80% in determining the appropriate level of investment to be included in the model. On its face this reduction appears excessive and a review of the justification for these adjustments only confirms this initial assessment.

The first adjustment made by the staff eliminates certain types of support assets from the calculation of general support facilities costs. These accounts excluded from cost recovery include land, special purpose vehicles and half the building investments. There is no reason given for these adjustments in the NPRM. The adjustments appear neither justifiable nor consistent. Why include 50% of the building investment costs but eliminate all the cost of the land those buildings are situated on. Has the FCC determined that in a forward-looking environment, buildings will no longer be located on land? If not, where will they be located? The order gives us no clue. Similarly, the NPRM excludes special work equipment from the calculation of support facilities. This is the heavy construction equipment necessary to build telecommunications facilities. Again we wonder why the FCC has determined that this equipment is no longer necessary to run a telecommunications network. Again the NPRM is silent on the issue.

The next column of adjustments reduces the plant investment by a ratio that in theory will restate the amounts to reflect forward-looking or current cost levels. They do this by dividing the GSF investment on the books by the actual booked investment for non-GSF plant accounts and then multiplying it by the projected plant investment for non GSF accounts. This adjustment reduces the level of the investment by an additional 39%. No justification is given for this adjustment. We can only speculate that the adjustment was designed to restate historic costs to their forward –looking or current cost levels. Again a review of the impacts of the adjustment indicates something is tremendously amiss. In the area or portion of the country from which the FCC derived their cost assumption the costs of buildings, cars, trucks and furniture is decreasing dramatically over time. According to the model, buildings and cars cost 69% of what they cost historically. USWEST has been unable to find any data to support such an assumption. However, we would be more than happy to give the FCC a ten percent commission if they could arrange all of our future purchases of these items at these projected discounts.

The final adjustment supposedly removes a portion of these support assets due to the fact that they are not needed for services than those are supported by the high cost fund. In explaining this adjustment the FCC states "Finally, the model reduces each of the preliminary GSF investment estimates by multiplying by one of two factors, which are the same as those used in the HAI model " (Note 348, page 84 of the FCC order). The NPRM proceeds to explain this adjustment as follows:

> We tentatively conclude that the model's preliminary estimate of GSF investment should be reduced, because only a portion of GSF investment is related to the cost of providing services supported by the federal mechanism. We also tentatively conclude that the synthesis model should not use the same factors as those used in the HAI model. The HAI sponsors, who developed the expense module in the synthesis model, have not shown why these particular factors should be used for this purpose. Instead, we tentatively conclude that total GSF investment should be reduced by factors that reflect the percentage of customer operations, network operations, and corporate operations used to provide the supported services.

This is virtually the sum of the arguments supporting the use of this factor. In several footnotes they provide further discussion of the calculation of the factors being used:

> These two factors are one minus either the Total Operations General Support Allocator (Total Operations Allocator) or the Office Worker

> General Support Allocator (Office Worker Allocator). The Total Operations Allocator is applied to the Motor Vehicles, Garage Work Equipment, and Other Work Equipment accounts, while the Office Worker Allocator is applied to the Furniture, Office Equipment, Buildings, and General Purpose Computer accounts. Each of these allocators is a fraction. The Total Operations Allocator is the ratio of the sum of customer operations expenses and corporate operations expenses to total operating expenses. The Office Worker Allocator is the ratio of the sum of corporate operations expenses and network operations expenses to the sum of customer operations expenses, corporate operations expenses and network operations expenses.

And:

> We tentatively conclude that the Office Worker Allocator should equal the ratio of the sum of the customer operations expenses, network operations expenses, and corporate operations expenses assigned to support services, to the sum of the expenses calculated on a total regulated basis. In theory the Total Operations Allocator should equal the Office Worker Allocator.....We tentatively conclude that the GSF investment should be calculated as a product of the Office Worker Allocator, calculated on a nationwide basis, and the preliminary GSF investment, which is calculated on a study area specific basis.

The only support given for the use of this allocator is that the HAI sponsored by AT&T and MCI used it. As stated above the model calculates GSF costs by multiplying the initial investment by factors "which are the same as those used in the HAI model." The write-up continues "The HAI sponsors, who developed the expense module in the synthesis model, have not shown why these particular factors should be used for this purpose." By their own words:

1. They adopt the allocator out of the HAI model;
2. They note that AT&T has shown no justification for the use of this allocator so it is revised; and
3. They provide absolutely no justification for the revised HAI allocator.

Since the only justification provided for the use of this allocator is refuted subsequently in the same order we again are forced to review the actual impact of applying the allocator to assess its credibility.

As illustrated on the above chart, 57% of the remaining GSF investment (i.e. remaining after the previous two adjustments) is eliminated from the model by the use of this allocator. Again, this is largely equipment used to maintain and track outside plant network facilities. The calculation of the allocator is never identified (Note 1), however, a brief description of the methods used to derive the allocator is provided. The allocator is based on the level of corporate operations, customer operations and network operations assigned to the supported services. Not included in this allocator are maintenance and capital investments. All of the garage and other work equipment being allocated using this factor. Maintenance workers are the only people that use this equipment, yet they are excluded from the development of the allocator. Computers are used to track network investments, schedule maintenance workers time, determine required network additions, track network operating results, identify network problems and a myriad of other network and overall financial tracking and reporting. Telecommunications is a facilities based industry. Financial statements must track the expenditures in this area to have any meaning to the stockholder or other users. Human resources dedicate a significant amount of their resources to maintaining an adequate construction workforce. In an industry whose very survival depends on the ability to maintain an adequate and functioning network, the FCC has determined that none of the systems that account for, monitor and/or schedule repairs of or upgrades to the network should be assigned to products based on the level of network activity. Instead the trucks a network technician uses are assigned to products based on the assignment of service representatives. No explanation is given for this approach, and none appears valid. The only potential justification is that the allocator results in the maximum elimination of costs from the model. In summary, the end result of applying the multitude of unexplained factors and ratios described above is that only 20% of the actual cost of these facilities is included in the model results.

G. Key Operating Expenses

Two key operating expense categories are *network operations* and *overheads*. Network operations expenses are for non-maintenance functions related to the overall operation of the network. These functions include many labor intensive tasks such as training technicians, testing network quality, and general engineering work that is not attributable to specific projects. U S WEST and the other large local exchange companies have achieved steady productivity gains in the performance of the tasks included in network operations, but this has been offset by inflation, so costs per access line have remained relatively constant.[24] While productivity improvements are likely to continue, so too will inflation. This supports keeping the network operations expense at current levels.

Consistent with the TSLRIC concept, SM should estimate the cost of operating the network with the most efficient current practices and technology, not technology and practices that may or may not be achieved sometime in the future. Parameters for running cost models, however, are likely to become self-fulfilling prophecies of future resource allocations. For example, if cost estimates are adopted that reflect large reductions in network operation expenses, U S WEST would need to perform these functions with many fewer resources than it uses today. Most of these resources are people. To operate its network within these costs,

[24] If a task took 100 hours to complete in 1988, and it takes 60 hours to complete in 1996, then the real cost of completing this task declined by 40 percent, reflecting a real increase in productivity. This is what analysis shows; U S WEST achieved a large increase in productivity over the past several years. During the same period, however, the labor rates also increased, in part to compensate labor for its increased productivity and in part in response to overall inflation. The net result is that today it costs the same amount to complete the task with 60 hours of labor as it did in 1988 with 100 hours of labor. Inflation has offset the productivity gains achieved by U S WEST in the provision of network operations expenses, and current costs reflect this fact.

U S WEST would need to significantly reduce the number of employees performing network operations functions immediately. This would almost certainly reduce service quality. Moreover, it is quite possible that the onset of competition and the demands caused by unbundling network elements will significantly <u>increase</u> the resource requirements for operating a high quality network.

The existence of significant, but not atypical, overhead expenses is a positive sign that U S WEST is taking advantage of economies of scale and scope in providing overhead functions. Overhead expenses exist because it is efficient to centralize certain functions, such as human resources and legal services. Performing these functions on a service specific basis would reduce the amount of expenses classified as overhead, since we could attribute the costs to specific services, but the duplication of efforts for these functions would be inefficient and increase the overall cost of providing service. In a TSLRIC environment, there is no *a priori* reason that these expenses should decline.

1. Common Support Services Expense

Common support services expenses as defined by the model include corporate, customer services and network operating expenses. Common support services expenses are calculated using a four-step process with three layers of factoring to eliminate costs from the model. The model first calculates a monthly common expense per access line using information derived from the ARMIS reports. The model then makes three adjustments to these book amounts to determine the amount of these costs to be included in the model. These adjustments consist of:

1. A regression analysis that is used to determine the amount of the total costs that can be statistically linked to supported services;
2. Specific adjustments to eliminate costs associated with certain non-supported products; and
3. A productivity adjustment to move the 1996 level costs forward to 1998.

Again we find that these multiple layers of adjustments dramatically reduce the amount of the costs that are included in the model. Following is a chart identifying the impact of each of these adjustments:

CATEGORY	Mo Cost/Line ARMIS	Cost/Line After Regression	Cost/Line Post Specific Eliminations	Cost/Line After Productivity	Percent of Original Amount
Marketing	1.72	0.58	0.03	0.02	**1.36%**
Customer Service	4.04	1.37	1.16	1.07	**26.49%**
Corporate Operations	4.69	2.81	2.81	2.60	**55.44%**
Other PP&E	0.02	0.07	0.07	0.07	**356.21%**
Network Operations	3.01	1.47	1.47	1.35	**45.04%**
Total Expenses	13.47	6.30	5.54	5.12	**37.97%**

As illustrated, more than 60% of the costs of these functions is eliminated as the result of the three adjustments described above. The question then becomes does this appear reasonable? Again the answer is no.

The initial adjustment is to eliminate a portion of the costs due to the fact that they are not incurred for the provision of supported services. This is accomplished through the use of a multivariable regression analysis. In explaining the regression analysis the NPRM states in part:

> Each equation estimates total expenses per total lines as a function of switched lines per total lines, special lines per total lines, and toll minutes per total lines, either in combination (Specification 1) or separated between intrastate toll and interstate toll minutes per total lines (Specification 2).

It then goes on to state:

> Each specification has been chosen to separate the portion of expenses that could be estimated as attributable to special access lines and toll usage, which are not supported by the high cost mechanism, rather than switched lines and local usage.

The toll minutes, used in the regression, are all long distance minutes (i.e. primarily interstate and intrastate access minutes of use). In other words, the regression analysis is designed to assign all the common support services expenses to access minutes, special access lines or local service lines. A review of the regression analysis shows that although there is a causal relationship between the level of expense and the variables listed above, the coefficient of determination or R^2 is fairly low. These coefficients range from 0.05 to 0.34 for each of the expense categories being regressed. This implies that although there is a causal relationship, that relationship only explains a small portion of the total costs being studied. Additional problems with the explanatory variables are that they are highly correlated. (See Attachment A). This fact makes it impossible to determine which explanatory variable causes the expense change.

Again we are left with the question of whether the regression analysis reasonably assigns these costs in light of the low correlation coefficient. A review of the results of the study provides the greatest insight into the reasonableness of the cost assignment resulting from the regression analysis. The NPRM only identifies those costs that are assigned to supported services. Following is a chart that identifies the assignment of annual costs per line to each service included in the regression analysis:

	Long Distance / Line	Switch lines / Total lines	Special lines / Total lines	Total Expense / Line	ARMIS / Line
Marketing - 6610					
Coefficient	$ 1.79	$ 7.19	$ 37.64		
Expense per Line	$ 8.01	$ 6.26	$ 4.83	$ 19.10	$ 20.63
% of Total	42%	33%	25%		
Service Expense - 6620					
Coefficient	$ 6.32	$ 17.28	$ 14.06		
Expense per Line	$ 28.26	$ 15.06	$ 1.81	$ 45.12	$ 48.45
% of Total	63%	33%	4%		
Corporate Operations - 6700					
Coefficient	$ 6.42	$ 34.24	$ 8.42		
Expense per Line	$ 28.70	$ 29.84	$ 1.08	$ 59.62	$ 56.27
% of Total	48%	50%	2%		
Other PP&E - 6510					
Coefficient	$ (0.08)	$ 0.85	$ (1.42)		
Expense per Line	$ (0.34)	$ 0.74	$ (0.18)	$ 0.22	$ 0.23
% of Total	-158%	340%	-84%		
Network Operations - 6530					
Coefficient	$ 3.30	$ 19.61	$ 40.27		
Expense per Line	$ 14.77	$ 17.09	$ 5.17	$ 37.03	$ 36.09
% of Total	40%	46%	14%		
Total Expense / Line	$ 79.38	$ 69.00	$ 12.71	$ 161.09	$ 161.67
Total Lines		153,131,044	22,557,510		
Lines / Total Lines		0.872	0.128		
Total Minutes / Total Lines (In thousands)	4.4716				
Total Expense / Minute	$ 0.02				

As illustrated, the regression analysis assigns more than **49 percent** of the total common support costs to access minutes or $79.38 per line per year. The model also identifies the total toll minutes per line per year as 4,472. By dividing the total common and support costs per line assigned to access minutes by the access minutes per line used in the regression analysis we can identify the common support costs per minute for access as derived by the model. As shown above the model derives a common support cost per access minute of $.02. This cost does not include any of the capital or maintenance costs associated with the switch investment used to provide the service. According to the HCPM the traffic sensitive common costs associated with access services alone exceeds the current access charge rate of approximately $.01 to $.02 per minute. According to the HCPM access charges are priced below costs. Does this mean the FCC is contemplating increasing access charges? What if a carrier purchases unbundled access from a CLEC? Is the rate for unbundled access greater than the current access charges? This whole analysis appears to be contrary to past positions of the FCC. Again the results of the analysis appear to contradict all that is known about telecommunications costs. Have we been wrong all this time?

Another adjustment reduces the 1996 expenses to reflect productivity changes between 1996 and the current year. The productivity factor used is the same 6% factor that was recently rejected by the courts. In total all these adjustments significantly impact the costs in the model, and all are flawed.

H. Customer Location Data

The PNR customer location data used in the SM is flawed because it misrepresents customer locations in large buildings and multi-tenant buildings. The PNR data treats each tenant as an individual residential-type location. The manner in which SM handles this data leads to a dramatic understatement of cost in urban areas, because it provides investments similar to those used in single-family residential areas even when designing plant to serve locations with many business customers. For example, in the Denver Curtis Park wire center (DNVRCOCP), the first cluster contains a mircrogrid (row 2, column 2) with 32 lots and 85.97 lines per lot, yet receives the investment for one NID per lot, one drop per lot, and one drop terminal for every four lots. The NID has a capacity of two or three lines, while serving 86 lines; the drop has a capacity of two or three lines, while serving 86 lines; and the drop terminal has the capacity for twenty-five lines, while serving 344 lines. This is clearly insufficient plant capacity to handle this number of lines.

The customer point location data shown below illustrates the input data used to develop loop plant.

X	Y	Cluster	Res Lines	Bus Lines
-1201	-2930	1	1.06	0.00
-1192	-2939	1	0.00	109.68
-1034	-2936	1	0.00	109.68
-1027	-2927	1	0.00	109.68
-1020	-2917	1	0.00	109.68
-1012	-2908	1	0.00	109.68
-1005	-2898	1	0.00	109.68
-1001	-2728	1	0.00	109.68
-1000	-2741	1	0.00	109.68
-999	-2753	1	0.00	109.68
-998	-2777	1	0.00	109.68
-998	-2765	1	0.00	109.68
-997	-2888	1	0.00	109.68
-997	-2789	1	0.00	109.68
-996	-2801	1	0.00	109.68
-995	-2825	1	0.00	109.68
-995	-2813	1	0.00	109.68
-994	-2838	1	0.00	109.68
-993	-2850	1	0.00	109.68
-992	-2862	1	0.00	109.68
-991	-2931	1	0.00	109.68
-991	-2919	1	0.00	109.68
-991	-2907	1	0.00	109.68
-991	-2894	1	0.00	109.68
-991	-2882	1	0.00	109.68
-991	-2874	1	0.00	109.68

Each of the 26 rows of data represents a customer location. The data in the columns labeled 'X' and 'Y' are the distances from the wire center switch. In this case, the data is taken from the Denver Curtis Park wire center, DNVRCOCP. The data was extracted after clustering by the SM. This data also represent a single microgrid in the clustering process.

Since the coordinates do not represent any actual business, it is difficult to pinpoint the exact location of the customers being modeled. However it appears that the business customers identified above probably belong in a single building or at most 2 buildings. Based on the X and Y coordinates, the area actually covered by this excerpted data is approximately 65 ft. by 200 ft. Utilizing the PNR data results in 25 business customers sharing lots approximately 13 ft. by 40 ft., each with over 100 lines. There is also a single residential customer location with 1.06 lines. The model logic is clearly understating the correct investment levels for customers such as the ones listed above.

Another customer location problem is that the PNR customer point locations are transformed by the SM to a different number of locations for no apparent reason. An example of this transformation is in **Attachment E** (appended hereto). **Attachment E** shows microgrids in cluster 1 on the DNVRCOCP wire center. Each row in the table lists a microgrid that is uniquely identified by the row and column number in the cluster. The next three columns list the residence customer, business customer, and total customer point locations in the microgrid. The next column is the SM's preliminary calculation of the number of lots required for the point locations. In eight out of ten microgrids the SM's preliminary lot calculation changes the number of customer points.

Next, the SM calculates the total lots in the microgrid based on its internal calculation of east-west lots and north-south lots. After this calculation, seven out of the ten microgrids have a different number of total lots than the customer point locations that are inputs to the SM. The next transformation that the SM perpetrates is to average the sum of the residence and business lines over the total lots. This reduces the number of lines in business locations and increases the lines in residence locations by homogenizing all locations within the microgrid. Thus, the SM converts the 25 business locations with 110 lines each and one residence location with 1 line into 32 locations with 85.97 lines per location. Of course, these locations continue to be served as if they are single family residential units, requiring only a single NID, a single drop, and a single drop terminal for four lots. Attachment 1 shows taking place in multiple microgrids within cluster 1. This demonstrates that the SM contains many anomalous algorithms. There are likely to be many more like this, but the use of Turbo Pascal code effectively eliminates anyone's ability to audit the procedures that take place within the model.

I. USE OF ROAD SURROGATE INFORMATION

At ¶ 34, the FCC notes, "...that the HAI proponents contend that use of surrogate algorithm may overstate the amount of plant necessary to provide supported services. We seek comment on the validity of this contention."

U S WEST believes that the selection of accurate and complete customer location data is as important as any other input to the SM. The failure to identify and model rural customers will lead to inappropriate fund sizing and unfair treatment of the very people the high cost USF most needs to serve. Based on AT&T and MCI's May 5, 1999 *Ex Parte*, U S WEST is concerned that the use of AT&T's flawed customer geocoding methods will lead to inaccurate and unfair treatment of rural customers.

U S WEST has shown that AT&T's geocoding method, as provided by Metro Mail, misses a large portion of rural customers, making it inappropriate for USF purposes until such time as geocoded data becomes significantly more accurate. In one of AT&T's examples from its *Ex Parte*, Wyoming, only 61.91% of housing units are correctly identified by geocoding – even fewer in rural areas. In fact over 36% of the Wyoming wire centers have no customer locations geocoded at all.[25] Even when AT&T claims to have geocoded a customer, the data may

[25] Based on data provided by AT&T in a March 2, 1998 Ex Parte to the FCC.

be in error, because geocoding uses mailing addresses that can include rural letter carrier addresses and post office boxes.

AT&T's justification for using geocoding is faulty and incomplete. AT&T proposes that its geocoding method will reduce investment by at most 8% (Wyoming), while the size of the fund will decrease 20%. AT&T also claims the shift in lines by density group will be minimal and slightly toward rural areas. Clearly these do not go together. The most likely explanation is that AT&T's geocoding data misrepresents the highest cost customers within any density group – a problem not addressed by the *Ex Parte's Total Lines by Zone* section. U S WEST advocates de-averaging USF support because this will target economic incentives where they are most needed. AT&T's geocoding proposal works against that goal by using incomplete and inaccurate data.

The *Ex Parte* is also logically flawed in its comparison of ARMIS data to SM outputs. A ratio of, for instance, ARMIS poles to SM poles, is meaningless because the SM generates a theoretical network that is not the same size as the actual existing network. It is no surprise, then, that the numbers do not match in this "apples to oranges" comparison. Any direct ratio of the two sets of numbers should be disregarded as being mathematically flawed.

For the above reasons, U S WEST recommends that the FCC utilize road surrogate location data based on more complete public information.

Based on the foregoing, there can be no doubt that the model and inputs have been manipulated to reach a predetermined result. **Attachment F** (appended hereto) shows how the state by state cost results have changed with each major release of the SM. The results clearly show that each major release resulted in drastic cost decreases in every state.

III. COMPARISON OF SM RESULTS – A REALITY CHECK

The ultimate test of a model's viability is whether or not it produces reasonable results. Suppose a builder makes his living building tract housing. Each new house he builds is identical to the last. The last four houses he built cost exactly $90,000. He hires a TELRIC modeler to determine the least cost forward-looking means of building a house. The modeler compiles a study and proclaims that the cost of building a house is $45,000, half of what it has historically cost to build the houses. The builder is perplexed. How could the cost of building houses be half of what he has historically spent to build those very same houses? The builder approaches the modeler to inquire as to the discrepancy. The modeler states that everyone knows that tract homebuilders are inefficient, and the model just proves this point. The builder asks what specific inefficiencies did the modeler find. The modeler states that his TELRIC model doesn't identify specific inefficiencies, it uses high level algorithms that estimate efficient forward-looking costs. The builder asks how the modeler can determine his model is accurate. The modeler states that the model correctly identified the inefficiencies that exist in this industry and therefore it had to be correct. The builder states that he knows of no other contractor that can build houses for half of his costs. The modeler states that this fact proves that the consensus and his model are correct. The whole industry is inefficient.

The model, much like the SM, does not identify any specific inefficiency. Instead, the model used high level algorithms and ratios to derive a result that matched the modelers preconceived conclusion. There were no checks on the reasonableness of the results, due to the fact that all existing comparable data was declared useless because it all reflected the predetermined inefficiencies of the industry. All potential reasonableness checks were discarded as irrelevant. The model does not identify even one area where inefficiencies exist, yet it assumes that these inefficiencies more than doubled the cost to the builder. The model is useless. It provides no insight into the actual cost of building a house. It provides no insight into potential efficiencies that could be achieved through better operating procedures. A model must be put through a reality check if it is to provide any benefit or insight to its users.

The SM should be tested in much the same way. One only needs to consider the findings on some of the most critical inputs to make that determination. For instance, structure sharing has a significant impact on the overall cost of the facilities being modeled. In finding that only 55 percent of the cost of placing buried and underground cable in densely populated areas should be assigned to the LEC, the commission eliminated the other 45 percent of these costs from the model. In their finding on structure sharing the commission states:

> We believe that the structure sharing percentages we tentatively adopt reflect a reasonable percentage of the structure costs that should be assigned to the LEC. We note that our tentative conclusions reflect the general consensus among commenters that structure sharing varies by structure type and density. While disagreeing on the extent of sharing, the majority of commenters agree that sharing occurs most frequently with aerial structure and higher density zones.

The Commission goes on to note that their belief is substantiated by the fact that the Washington Commission adopted sharing values similar to those they adopt. It is interesting to note that the advisor for the Washington Commission is the same Doctor Gable that is referenced throughout the findings in the notice as a primary advisor to the FCC staff. This is the extent of the documentation supporting one of the most critical assumptions of the model. The finding is based on a belief by the Commission substantiated by the belief of another Commission, both of which relied on the judgment of the same consultant. Most of the other major inputs are similarly based on judgment or extrapolations and not studies of actual incurred costs. In this world of hypotheticals and conjecture it is only reasonable that the results must be analyzed to determine their reasonableness.

Following is a high level comparison of the results of the SM to the actual booked cost of USW in the state of Colorado:

Comparison of Actual Booked Costs to HCPM Outputs

	Books	HCPM	% Diff
Invenstment	$ 5,562,422,000	$ 2,831,688,173	-49%
Expense	$ 916,930,183	$ 352,356,889	-62%

As illustrated above the SM finds that the cost to rebuild the USW network would be approximately 51% of the depreciated investment value of U S WEST's plant. This number, even making allowance for depreciation reserve deficiencies resulting from regulatory decisions, is preposterous on its face. In addition, the model finds that the cost of operating that network and running the business (i.e. the daily expenses of running USW) are 38% percent of what the company currently incurs to perform these functions. Advocates of the model results would argue that these findings are reasonable due to the fact that telecommunications is a declining cost industry and the projected costs produced by the SM just reflect this fact. The questions is whether there is merit in either of these assertions.

There is an assumption that telecommunications is a declining cost industry. Improvements in technology are reducing the costs of all firms, which operate in technology driven industries. Telecommunications is a technology driven industry. The costs of providing telecommunications services must therefore be declining. There is no argument that the costs of the equipment, such as switches and multiplexers, used to provide telecommunications services are declining, and that the per-unit cost of providing more services on the average is declining. However, the major cost component of any telecommunications network is not the electronics that guide the telephone signal, but the wires over which that signal is transmitted. These wires consist of copper and fiber that must be placed in the ground or on poles in much the same manner as it was in the past. There is no evidence that the cost of purchasing these cables and placing them in the ground is declining. In fact, the evidence refutes this assumption. However, that is not what is reflected in the SM.

Following is a breakdown by plant account of the comparison between the USW Colorado plant investment produced by the SM and the amount that USW actually spent to construct these facilities:

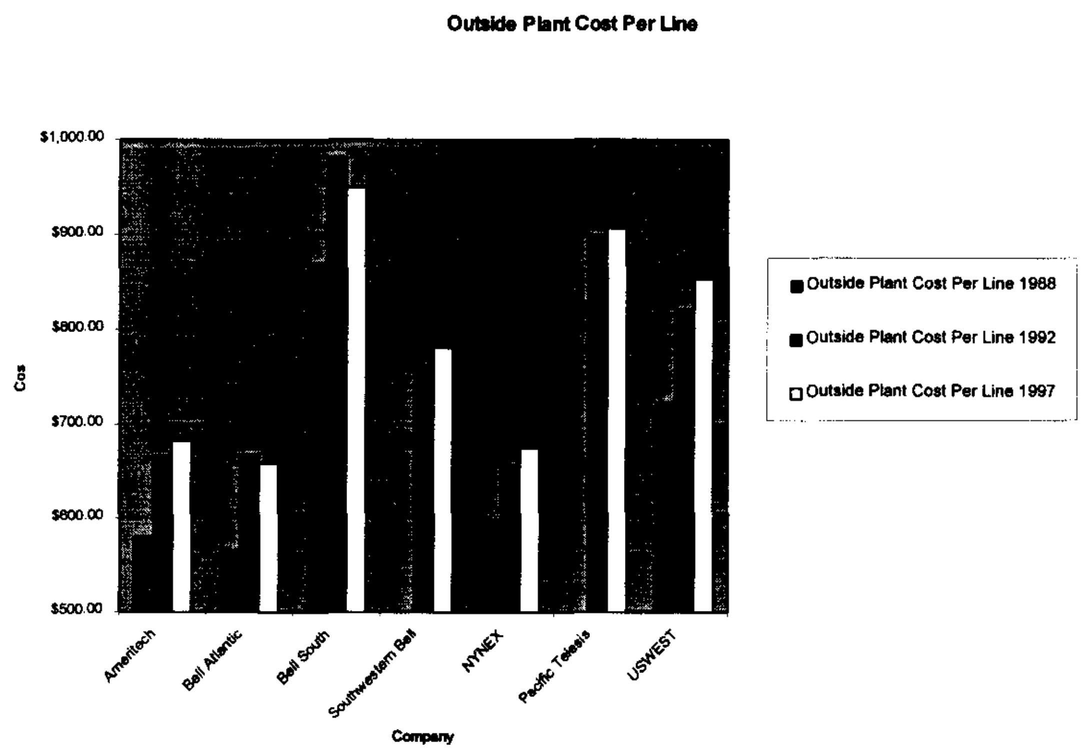
Comparison of Actual Book to HCPM Investments	Book	HCPM	%
OSP	$2,146,841,000	$1,794,166,403	84%
Central Office Switch	885,344,000	233,833,887	26%
Circuit	1,132,442,000	430,612,549	38%
General Support	836,769,000	220,285,376	26%
Land	15,083,000	12,787,997	85%
Buildings	485,746,000	127,744,998	26%
Other	60,197,000	12,256,962	20%
Total	$5,562,422,000	$2,831,688,173	51%

As illustrated, the SM estimates that the cost of purchasing and placing switching equipment has decreased 74%. Similarly, the model estimates that the forward-looking cost of purchasing and placing outside plant facilities (i.e. the cables over which the signal is carried) has decreased by 16%. All evidence points to the fact that the costs of the electronic equipment (e.g. switches and multiplexers) used to run the network is declining. However, the same information indicates that the opposite is true for the outside plant facilities or cables that carry the signal to the home. The evidence shows that the cost of building these facilities is actually increasing.

As an interesting aside, the model shows the cost of land and buildings in Colorado declining dramatically. Such is, of course, not an accurate assessment of the direction of real estate prices in Colorado. This type of factual anomaly seriously undercuts the overall validity of the SM.

In general, everyone recognizes that the cost of purchasing switches is declining throughout the industry. The SM correctly estimates that the cost of a new switching network is declining. However, the magnitude of the decline (*i.e.*, 74%) seems excessive.

The scenario changes for outside plant or cable facilities. Following is a chart showing the change in outside plant investment per line for each regional operating company over the last ten years.



The investment in outside plant investment per line has increased for each of the companies identified. Not one company experienced a decline in these costs over the total ten-year period.

This chart will understate the incremental change in costs, since most of the investment remains constant from year to year. The outside plant analysis shows that the cost of placing cable is increasing. This result is completely opposite the SM results that indicate that these costs have decreased significantly.

Other available information further supports the contention that the cost of placing loop facilities is increasing. The FCC even relied on similar information in deriving the expense factors used in the SM. As stated previously the staff used a current to book ratio to adjust historic plant levels to current dollars in calculating their expense factors. As stated in the Notice:

> The current to book ratio is a tool that is used to restate the historic, financial account balance on a company's books, which reflects investment decisions made over many years, to present day replacement costs. (Para 205)

In other words it is designed to reflect the difference between actual historic cost of the investments and the amount that would be required to replace that investment at today's dollars. The FCC goes on to state:

> The resulting current-to-book ratio will be greater than one if current costs are rising relative to the historic costs and less than one if current costs are declining.

If the ratio is greater than one, it indicates that the cost of building facilities today is greater than it was in the past. As stated previously, in calculating expense factors, the higher the plant value the lower the factor and the lower the overall cost in the model. The FCC does not publish the current to book cost ratios they use in calculating factors because the "ratios submitted by these companies are proprietary information" (Note 373), so it is not possible to identify the actual current to book cost ratios used by the FCC. However, it is possible to estimate the general direction and potential magnitude of these ratios by referring to the source information from which they are calculated.

The ILEC's calculate current to book ratios using the telephone plant index (TPI). The telephone plant index is a measure of the change in the costs of building various telephone facilities over time. The current costs used in the current to book cost ratio is developed by taking the booked historic investments and moving them forward through time using the telephone plant indexes. If the telephone plant index is increasing, the current costs will be greater than the book costs. Attachment G (appended hereto) shows the telephone plant index for each category of outside plant for the last twenty years. Following is a chart showing selected ratios from the attachment:

Percent Increase (Decrease) in Cost of Plant Over a Period

OSP Assets	Five Year % Change	Ten Year % Change	Twenty Year % Change
Aerial Cable-Combined	12.54%	29.31%	99.55%
Copper	13.70%	32.24%	104.07%
Optical	-11.99%	-28.19%	
U.G. Cable Combined	-0.26%	-3.35%	18.15%
Copper	11.23%	25.36%	53.25%
Optical	-12.26%	-34.89%	
Buried Cable Combined	14.33%	22.79%	74.42%
Copper	17.72%	32.91%	88.79%
Optical	-3.62%	-19.91%	
Conduit Systems	9.72%	9.83%	94.04%

As illustrated, the telephone plant index indicates that the cost of building most outside plant facilities has increased dramatically over the last ten years. The cost for virtually all the outside plant accounts has increased dramatically over time. The only items that show declining costs are the various categories of optical fiber. However, the combined accounts (i.e. optical